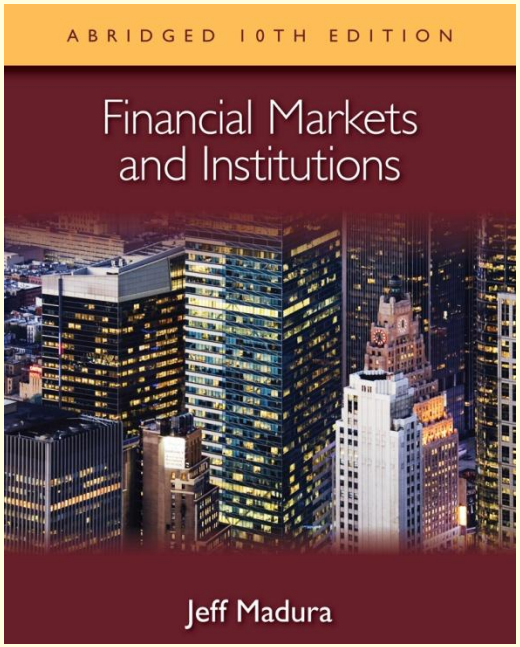
Financial Markets and Institutions

Abridged 10th Edition

by Jeff Madura



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9 Mortgage Markets

Chapter Objectives

- provide a background on mortgages
- describe the common types of residential mortgages
- explain the valuation and risk of mortgages
- explain mortgage-backed securities
- explain how mortgage problems led to the 2008–2009 credit crisis

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Background on Mortgages

1. A **mortgage** is a form of debt to finance a real estate investment
2. The mortgage contract specifies:
    a. Mortgage rate
    b. Maturity
    c. Collateral
3. The originator charges an origination fee when providing the mortgage
4. Most mortgages have maturities of 30 years, but 15-year maturities are also available.

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How Mortgage Markets Facilitate the Flow of Funds

1. Mortgages originators obtain their funding from household deposits and by selling some of the mortgages that they originate directly to institutional investors in the secondary market.
2. These funds are then used to finance more purchases of homes, condominiums, and commercial property.
3. Mortgage markets allow households and corporations to increase their purchases of homes, condominiums, and commercial property and finance economic growth.

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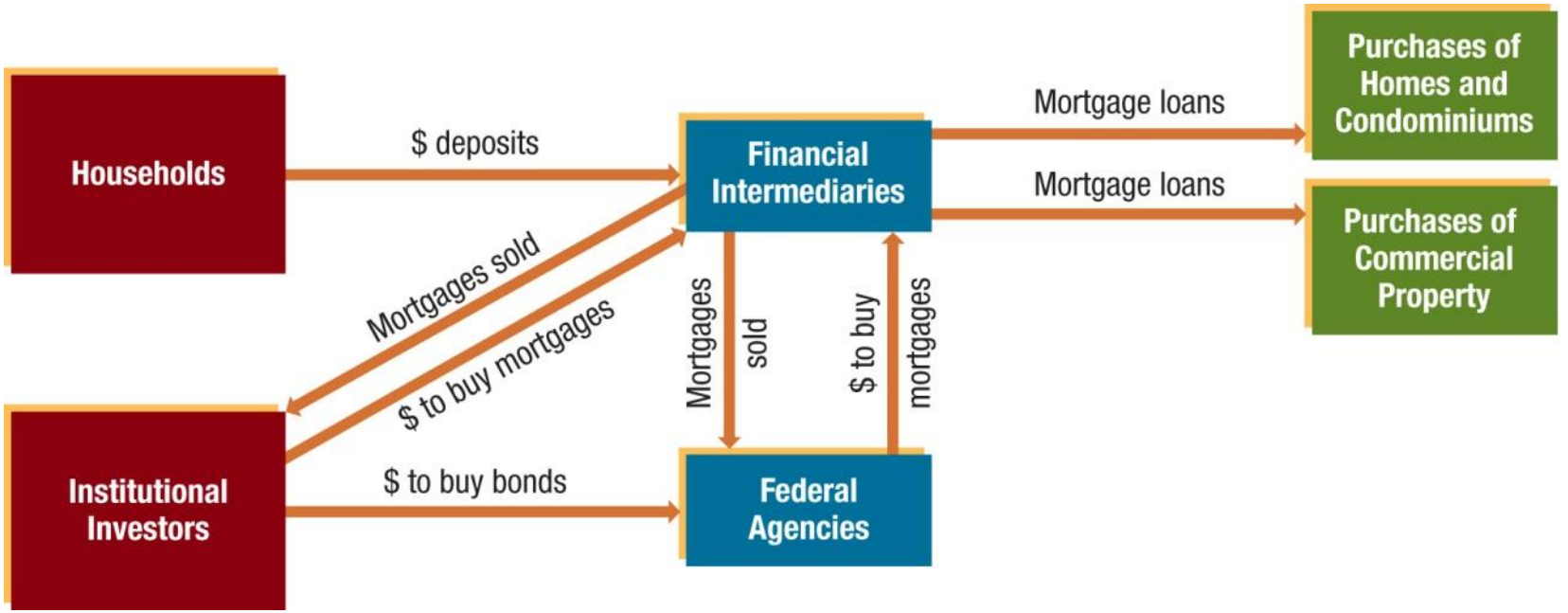
Exhibit 9.1 How Mortgage Markets Facilitate the Flow of Funds



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How Mortgage Markets Facilitate the Flow of Funds

1. Institutional Use of Mortgage Markets

a. Mortgage companies, savings institutions, and commercial banks originate mortgages.

b. Mortgage companies tend to sell their mortgages in the secondary market, although they may continue to process payments for the mortgages that they originated.

c. The common purchasers of mortgages in the secondary market are savings institutions, commercial banks, insurance companies, pension funds, and some types of mutual funds.

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Exhibit 9.2 Institutional Use of Mortgage Markets

TYPE OF FINANCIAL INSTITUTION	INSTITUTION PARTICIPATION IN MORTGAGE MARKETS
Commercial banks and savings institutions	• Originate and service commercial and residential mortgages and maintain mortgages within their investment portfolios. • Bundle packages of mortgages and sell mortgage-backed securities representing the packages of mortgages. • Purchase mortgage-based securities.
Credit unions and finance companies	• Originate mortgages and maintain mortgages within their investment portfolios.
Mortgage companies	• Originate mortgages and sell them in the secondary market.
Mutual funds	• May sell shares and use the proceeds to construct portfolios of mortgage-backed securities.
Securities firms	• Bundle packages of mortgages and sell mortgage-backed securities representing the packages of mortgages. • Offer instruments to help institutional investors in mortgages hedge against interest rate risk.
Insurance companies	• Commonly purchase mortgages or mortgage-backed securities in the secondary market.

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Criteria Used to Measure Creditworthiness

1. **Level of equity invested by the borrower**
   a. The lower the level of equity invested, the higher the probability that the borrower will default.
   b. One proxy for this factor is the loan-to-value ratio, which indicates the proportion of the property's value that is financed with debt.
2. **Borrower's income level** - Borrowers who have a lower level of income relative to the periodic loan payments are more likely to default on their mortgages.
3. **Borrower's credit history** - Borrowers with a history of credit problems are more likely to default on their loans.

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Classification of Mortgages

1. Prime versus Subprime Mortgages

a. Prime: borrower meets traditional lending standards

b. Subprime: borrower does not quality for prime loan

   i. Relatively lower income

   ii. High existing debt

   iii. Can make only a small down payment

2. Insured versus Conventional Mortgages

a. Insured: loan is insured by FHA or VA

b. Conventional: loan is not insured by FHA or VA but can be privately insured

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Types of Residential Mortgages

1. Fixed-rate mortgages
2. Adjustable-rate mortgages (ARMs)
3. Graduated-payment mortgages (GPMs)
4. Growing-equity mortgages
5. Second mortgages
6. Shared-appreciation mortgages
7. Balloon payment mortgages

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Types of Residential Mortgages

1. Fixed-rate mortgages

a. locks in the borrower's interest rate over the life of the mortgage.

b. A financial institution that holds fixed-rate mortgages is exposed to interest rate risk because it commonly uses funds obtained from short-term customer deposits to make long-term mortgages.

c. Borrowers with fixed-rate mortgages do not suffer from rising rates, but they do not benefit from declining rates.

Amortizing Fixed-Rate Mortgages

An **amortization schedule** shows the monthly payments broken down into principal and interest.

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Types of Residential Mortgages

2. Adjustable-rate mortgages (ARMs)

a. Allows the mortgage interest rate to adjust to market conditions.

b. Contract will specify a precise formula for this adjustment.

c. Some ARMs contain a clause that allow the borrower to switch to a fixed rate within a specified period.

ARMs from the Financial Institution's Perspective

- Because the interest rate of an ARM moves with prevailing interest rates, financial institutions can stabilize their profit margin.
- If market interest rates move outside given boundaries, the profit margin on ARMs could be affected.

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Exhibit 9.3 Example of Amortization Schedule for Selected Years (Based on a 30-Year, $100,000 Mortgage at 8 Percent)

PAYMENT NUMBER	PAYMENT OF INTEREST	PAYMENT OF PRINCIPAL	TOTAL PAYMENT	REMAINING LOAN BALANCE
1	$666.66	$ 67.10	$733.76	$99,932.90
2	666.21	67.55	733.76	99,865.35
100	604.22	129.54	733.76	90,504.68
101	603.36	130.40	733.76	90,374.28
200	482.01	251.75	733.76	72,051.18
201	480.34	253.42	733.76	71,797.76
300	244.52	489.24	733.76	36,188.12
301	241.25	492.51	733.76	35,695.61
359	9.68	724.08	733.76	728.91
360	4.85	728.91	733.76	0

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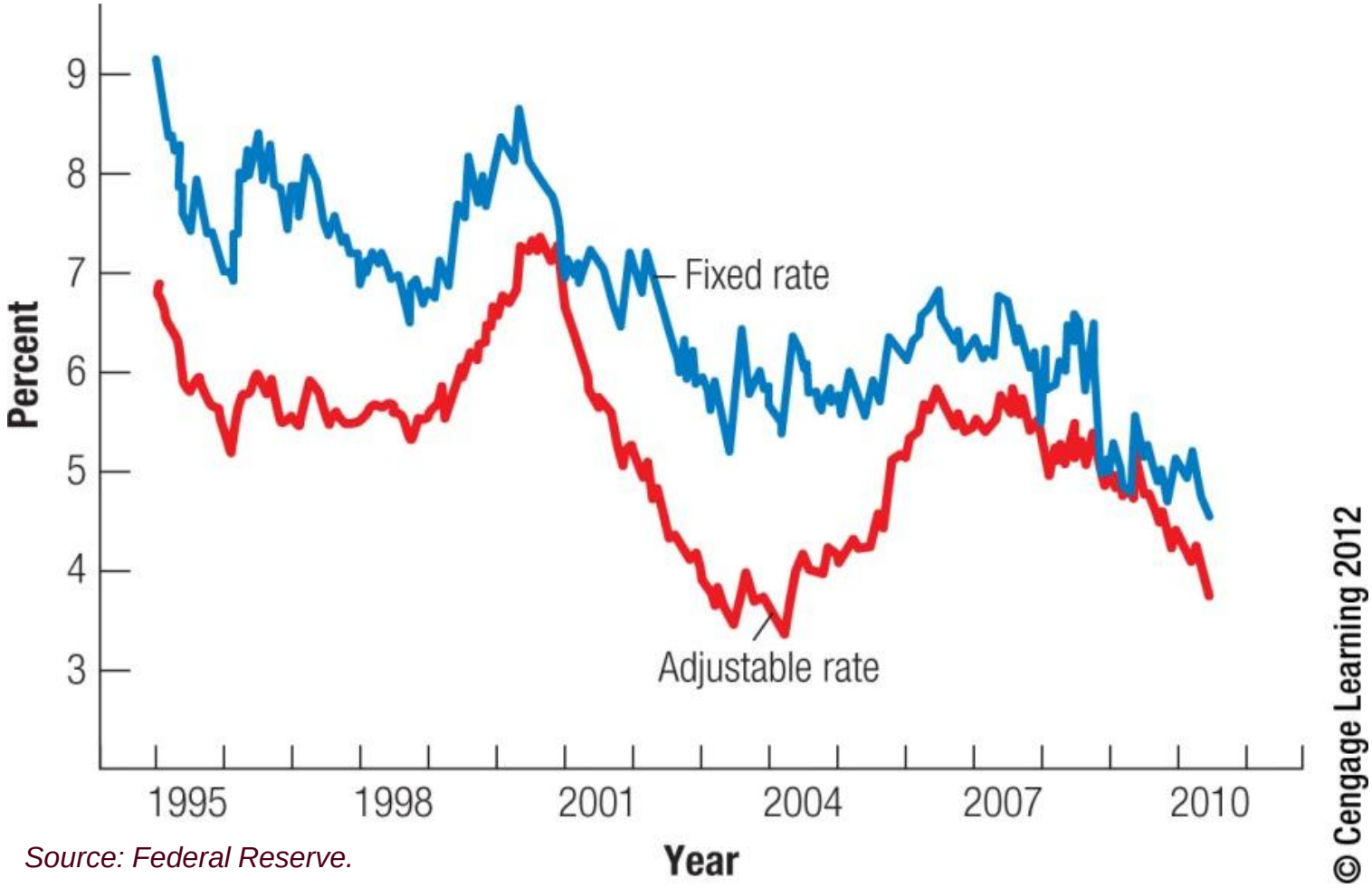
Exhibit 9.4 Comparison of Rates on Newly Originated Fixed-Rate and Adjustable-Rate Mortgages over Time



Source: Federal Reserve.

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Types of Residential Mortgages

3. **Graduated-payment mortgages (GPMs)** - Allows the borrower to make small payments initially on the mortgage; the payments increase on a graduated basis over the first 5 to 10 years and then level off.

4. **Growing-equity mortgages** - Monthly payments are initially low and increase over time. The payments never level off but continue to increase throughout the life of the loan.

5. **Second mortgages** - A second mortgage can be used in conjunction with the primary or first mortgage.

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Types of Residential Mortgages

6. **Shared-appreciation mortgages** - allows a home purchaser to obtain a mortgage at a below-market interest rate. In return, the lender will share in the price appreciation of the home.

7. **Balloon payment mortgages -** Requires only interest payments for a three-to five-year period. At the end of this period, the borrower must pay the full amount of the principal (the balloon payment).

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Valuation and Risk of Mortgages

The market price (PM) of a mortgage should equal the present value of its future cash flows:

$$P_M = \sum_{t=1}^{n} \frac{C + \text{Prin}}{(1+k)^t}$$

Where:

P_M	= market price of mortgage
C	= interest payment
Prin	= principal payment
k	= required rate of return

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Risk from Investing in Mortgages

1. **Credit risk:** the risk that borrower will make a late payment or will default.

2. **Interest rate risk:** the risk that value of mortgage will fall when interest rates rise.

3. **Prepayment risk:** the risk that the borrower will prepay the mortgage when interest rates fall.

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Mortgage-backed Securities

1. Securitization:

- the pooling and repackaging of loans into securities.
- Securities are then sold to investors, who become the owners of the loans represented by those securities.

2. The Securitization Process

a. A financial institution such as a securities firm or commercial bank combine individual mortgages together into packages.

b. The issuer of the MBS assigns a trustee to hold the mortgages as collateral for the investors who purchase the securities.

c. After the securities are sold, the financial institution that issued the MBS receives interest and principal payments on the mortgages and then transfers (passes through) the payments to investors that purchased the securities.

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Types of Mortgage-Backed Securities

1. GNMA (Ginnie Mae) mortgage-backed securities
2. Private label pass-through securities
3. FNMA (Fannie Mae) mortgage-backed securities
4. FHMLC (Freddie Mac) participation certificates
5. Collateralized mortgage obligations (CMOs)

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Types of Mortgage-Backed Securities

1. GNMA (Ginnie Mae) mortgage-backed securities

a. The Government National Mortgage Association (called GNMA, or Ginnie Mae) was created in 1968 as a corporation that is wholly owned by the federal government.

b. Guarantees timely payment of principal and interest to investors who purchase securities backed by FHA and VA mortgages.

2. Private label pass-through securities

a. Backed by conventional rather than FHA or VA mortgages.

b. Insured through private insurance companies.

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Types of Mortgage-Backed Securities

3. FNMA (Fannie Mae) mortgage-backed securities

a. The Federal National Mortgage Association was created in 1938 to develop a more liquid secondary market for mortgages.

b. Channels funds from institutional investors to financial institutions that desire to sell their mortgages.

4. FHLMC (Freddie Mac) Participation Certificates

a. The Federal Home Loan Mortgage Association was chartered as a corporation in 1970 to ensure that sufficient funds flow into the mortgage market.

b. Sells participation certificates and uses the proceeds to finance the origination of conventional mortgages from financial institutions.

c. Fannie Mae and Freddie Mac enhance liquidity in the mortgage market,

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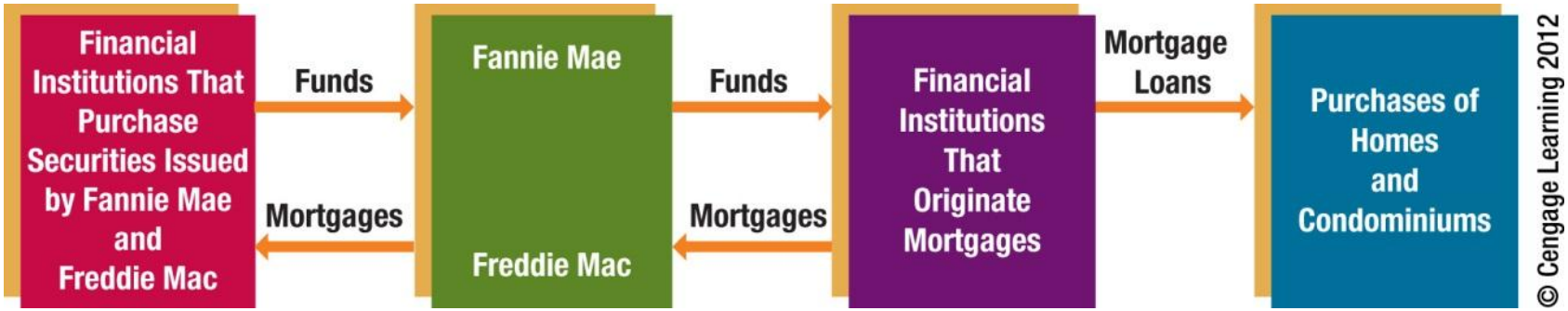
Exhibit 9.5 How Fannie Mae and Freddie Mac Enhance Liquidity in the Mortgage Market



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Types of Mortgage-Backed Securities

5. Collateralized mortgage obligations (CMOs)

a. Mortgages are segmented into tranches (classes), according to their maturity, and the cash flows provided by each tranche are typically structured in a sequential manner.

b. Any repaid principal is initially sent to owners of the first tranche until the total principal amount is fully repaid. Then, principal is paid to the second tranche. This process continues until principal payments are made to owners of the last-tranche CMOs. Issues of CMOs typically have from three to ten tranches.

c. Sometimes segmented into interest-only (IO) and principal-only (PO) tranches.

d. Some mortgages are also sold through a collateralized debt obligation (CDO), which is a package of debt securities backed by collateral that is sold to investors.

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Valuation of Mortgage-Backed Securities

1. The valuation of MBS is difficult because of limited transparency.
2. There is no centralized reporting system that reports the trading of MBS in the secondary market.
3. Reliance on Ratings to Assess Value
   a. Investors may rely on rating agencies (Moody's, Standard & Poor's, or Fitch).
   b. Many institutional investors will not purchase MBS unless they are highly rated.
4. **Fair Value of Mortgage-Backed Securities** - may attempt to rely on prices of MBS that are traded in the secondary market in order to determine the market value.

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Mortgage Credit Crisis

1. Interest rates increased in 2006, which made it more difficult for existing homeowners with adjustable-rate mortgages to make their mortgage payments.
2. Low initial “teaser rates” were expiring and these homeowners also faced higher mortgage payments.
3. By June 2008, 9 percent of all American homeowners were either behind on their mortgage payments or were in foreclosure.

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Impact of the Credit Crisis on Fannie Mae and Freddie Mac

1. The agencies had invested heavily in subprime mortgages that required homeowners to pay higher rates of interest.
2. By 2008, many subprime mortgages defaulted, so Fannie Mae and Freddie Mac were left with properties (the collateral) that had a market value substantially below the amount owed on the mortgages that they held.
3. Funding Problems
   a. With poor financial performance, Fannie Mae and Freddie Mac were incapable of raising capital.
   b. FNMA and FHLMC stock values had declined by more than 90 percent from the previous year.

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Impact of the Credit Crisis on Fannie Mae and Freddie Mac

4. Rescue of Fannie Mae and Freddie Mac

a. In September 2008, the U.S. government took over the management of Fannie Mae and Freddie Mac.

b. The Treasury agreed to provide whatever funding would be necessary to cushion losses from the mortgage defaults.

c. In return, the Treasury received $1 billion of preferred stock in each of the two companies.

d. The U.S. government allowed Fannie Mae and Freddie Mac to obtain funds by issuing debt securities so that they could resume purchasing mortgages and thereby ensure a more liquid secondary market for them.

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Systemic Risk Due to the Credit Crisis

1. Mortgage insurers that provided insurance to homeowners incurred large expenses.
2. Some financial institutions with large investments in MBS were no longer able to access sufficient funds to support their operations during the credit crisis.
3. Individual investors whose investments were pooled (by mutual funds, hedge funds, and pension funds) and then used to purchase MBS experienced losses.
4. **International Systemic Risk** - Financial institutions in other countries (e.g., the United Kingdom) had offered subprime loans, and they also experienced high delinquency and default rates.

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Who Is to Blame?

1. **Mortgage originators** - some mortgage originators were aggressively seeking new business without exercising adequate control over quality.
2. **Credit rating agencies** - The rating agencies, which are paid by the issuers that want their MBS rated, were criticized for being too lenient in their ratings shortly before the credit crisis.
3. **Financial institutions that packaged MBS** - Could have verified the credit ratings assigned by the credit rating agencies by making their own assessment of the risks involved.

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Who Is to Blame?

4. **Institutional investors that purchased MBS** - relied heavily on the ratings assigned to MBS by credit rating agencies without the due diligence of performing their own independent assessment.

5. **Financial institutions that insured MBS** - presumed, incorrectly, that the MBS would not default.

Conclusion about Blame

The question of who is to blame will be argued in courtrooms.

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Government Programs Implemented in Response to the Crisis

1. **The Housing and Economic Recovery Act of 2008.**
   a. Enabled some homeowners to keep their existing homes and therefore reduced the excess supply of homes for sale in the market.
   b. Financial institutions must be willing to create a new mortgage that is no more than 90 percent of the present appraised home value.
   c. Financial institutions that volunteer for the program essentially forgive a portion of the previous mortgage loan when creating a new mortgage.
2. Other programs promoted "**short sale**" transactions in which the lender allows homeowners to sell the home for less than what is owed on the existing mortgage.

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Government Bailout of Financial Institutions

1. On October 3, 2008, the **Emergency Economic Stabilization Act of 2008** (also referred to as the bailout act) enabled the Treasury to inject $700 billion into the financial system and improve the liquidity of financial institutions with MBS holdings.

2. The act also allowed the Treasury to invest in the large commercial banks as a means of providing the banks with capital to cushion their losses.

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Financial Reform Act

1. In July 2010 the **Financial Reform Act** was implemented, and one of its main goals was ensuring stability in the financial system.
2. The act mandated that financial institutions granting mortgages verify the income, job status, and credit history of mortgage applicants before approving mortgage applications.
3. The act also required that financial institutions that sell mortgage-backed securities retain 5 percent of the portfolio unless the portfolio meets specific standards that reflect low risk.

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SUMMARY

- Residential mortgages can be characterized by whether they are prime or subprime, whether they are federally insured, the type of interest rate used (fixed or floating), and the maturity. Quoted interest rates on mortgages vary at a given point in time, depending on these characteristics.
- Various types of residential mortgages are available, including fixed-rate mortgages, adjustable-rate mortgages, graduated-payment mortgages, growing equity mortgages, second mortgages, and shared appreciation mortgages.
- The valuation of a mortgage is the present value of its expected future cash flows, discounted at a discount rate that reflects the uncertainty surrounding the cash flows. A mortgage is subject to credit risk, interest rate risk, and prepayment risk.

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SUMMARY (Cont.)

- Mortgage-backed securities (MBS) represent packages of mortgages; the payments on those mortgages are passed through to investors. Ginnie Mae provides a guarantee of payments on mortgages that meet specific criteria, and these mortgages can be easily packaged and sold. FannieMae and Freddie Mac issue debt securities and purchase mortgages in the secondary market.

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SUMMARY (Cont.)

- Mortgages were provided without adequate qualification standards (including allowing very low down payments) in the 2003–2006 period. Then a glut in the housing market caused a drastic decline in home prices, with the result that the market values of many homes were lower than the mortgages. Many homeowners defaulted on their mortgages, which led to a credit crisis in the 2008–2009 period. The U.S. government use various strategies to revive the U.S. mortgage market, including an emergency housing recovery act, the rescue of Fannie Mae and Freddie Mac, and a bailout of financial institutions that had heavy investments in mortgages and mortgage-backed securities.

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